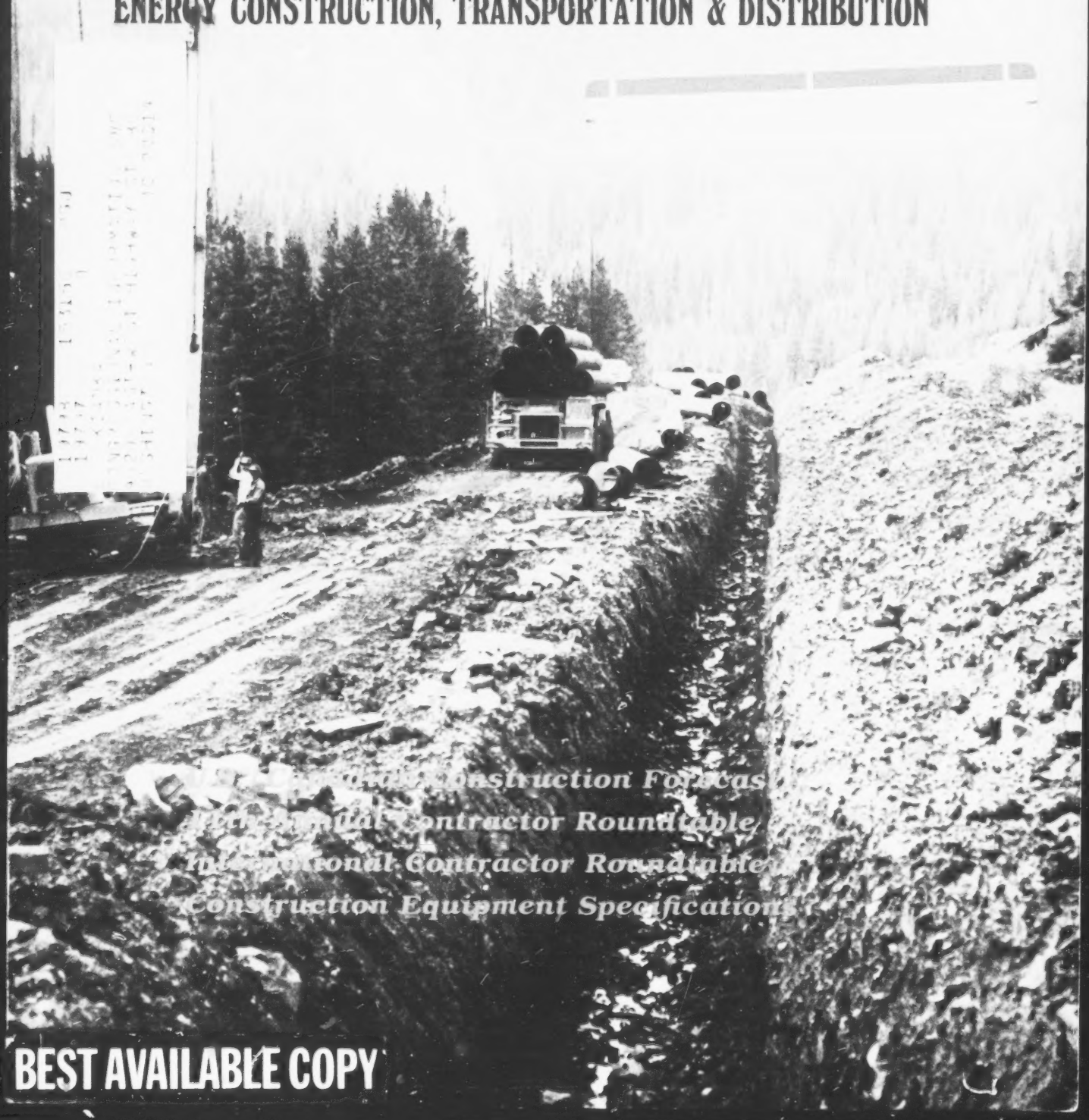
A HARCOURT BRACE JOVANOVICH PUBLICATION

JANUARY 1981
122nd YEAR

PIPELINE & GAS JOURNAL

ENERGY CONSTRUCTION, TRANSPORTATION & DISTRIBUTION



Construction Forecas

Contractor Roundtable

International Contractor Roundtable

Construction Equipment Specifications

BEST AVAILABLE COPY

PIPELINE & GAS JOURNAL

International Pipeline & Gas Utility Design, Construction & Operation

Published Continuously Since 1859

in this issue

Newsreel 2
Highlights of month's news

Government Guidelines 4
State & Federal regulatory memo

Upstream 6
Future events in today's news

Reflections 8
A glimpse of 50 & 100 years ago

MCF 10
Industry news/developments

Projects 12
New systems/expansion/developments

People On The Move 78

Professional Directory 84

Meetings 83

Bookshelf 62

Advertisers' Index EM 18

Energy Management Report

Comment EM 1

Energy World Report EM 2

Governments Take 72% EM 4

Financial Notebook EM 5

Professional Opportunities EM 7

New Products EM 13

THE COVER

"Magnum Four" universal flatbed carrier was used for first time to haul pipe for stringing on prebuild work in southeast British Columbia.

—Photo courtesy of Alan Bailey, Natural Gas Today.

JANUARY 1981 • VOLUME 208 • NUMBER 1

Pipeline Construction Outlook Great 20
Exclusive 11th annual P&GJ Contractor Roundtable summary: 1981 will be great year for gas pipeline construction; new outlook in Washington will improve nation's energy lot, economy; people and equipment shortages probable as Alaska gas pipeline work expands.

International Work To Be Stable. 24
Leading international pipeline contractors express their views on outlook for world pipeline construction prospects, economic developments, equipment and personnel requirements, and new equipment needs in report on P&GJ's exclusive International Pipeline Contractors Roundtable.

1981 Construction To Rise 25% 28
Over 36,567 miles of pipelines planned, proposed, or underway in the U.S. at beginning of 1981; over 11,200 miles to be installed during the year.

Planned and Proposed Pipeline Projects . . 32
Complete tabulation of major crude oil, refined products, natural gas, carbon dioxide, and slurry pipeline projects now under construction, planned or proposed in the U.S.

Canadian Work Sparked By Prebuild. 40
Pipeline construction in Canada, finally, has taken off in a rush that promises to keep big-inch contractors busy for several years.

Canadian Prebuild Sections On-Time 44
Banister and Marine Pipeline worked vigorously in last half of 1980 to complete work on two major Foothills Pipeline construction projects.

CONEXPO To Exhibit Tomorrow's Equipment 50
Preview of what to see at the gigantic construction equipment show.

Australia Expecting Construction Boom . . 52
Unprecedented increase in pipeline construction faces contractors in Australia as work gets underway on a myriad of oil, gas, and products lines.

Construction Equipment Specifications . . . 58
P&GJ's exclusive "spec sheets" on the construction equipment used by pipeline/gas distribution contractors and operating companies gets underway this issue; "pipelayers" featured.

Hobart Celebrates 50th Year. 65
School of Welding Technology in Ohio has been training skilled welding personnel for over a half-century.

Nation's Newest Pipe Mill 68
Largest diameter steel pipe mill now being operated by Berg Steel Pipe Corp.

Biggest River Crossing Boring Machine . . 74
Reading & Bates Construction Co. unveils 1 million-lb pull horizontal drilling machine to make super-crossings under rivers.

—Photo by Larry Lee, courtesy of Pacific Interstate Transmission Co.

Western leg of the prebuild sections of the Alaskan Highway Gas Pipeline Project is underway with 341 miles of 30 and 24-in. being built by Northwest Pipeline Corp. and 160.5 miles of 42-in. by Pacific Gas Transmission. Shown here, weldor at work on NWPL's 30-in. line in Oregon.

Pipeline Construction Activity To Be Up Over 25% In 1981

by Dean Hale, *Editor*

Pipeline construction activity in the United States in 1981 is expected to show an increase of over 25% compared to 1980 as the number of pipeline projects planned, proposed, or underway reached a total of 36,567 miles at the beginning of 1981. Over 11,239 miles of cross-country pipelines are expected to be installed during 1981 as mainlines and gathering systems, according to PIPELINE & GAS JOURNAL's annual U.S. Pipeline Construction Survey.

Total for all planned, proposed, or underway projects in the U.S. plus Canada is 46,275 miles. Over 2000 miles of mainline and gathering lines are expected to be installed in Canada during 1981, much of it to be large diameter gas pipeline (see related article in this issue).

The total of 12,200 miles of pipeline construction in the U.S. and Canada provides a morale-building boost to the pipeline business and to cross-country pipeline contractors, all of whom have been wondering if predicted gains in activity were just illusory.

In the United States, the breakdown is 16,787 miles of

1981 PIPELINE OUTLOOK

Miles Planned or Underway

Type of Line	U.S.	Canada
Natural Gas	16,787	7,822
CO_2 (Carbon Dioxide)	1,168	—
Crude Oil	4,819	1,278
Products	5,500	608
Slurry	8,293	—
TOTALS	36,567	9,708
GRAND TOTAL, U.S. and CANADA		46,275

Projected 1980 Completion, Miles

Type of Line	U.S.	Canada
Natural Gas	4,124	
CO_2	578	
Crude Oil	720	2,000
Products	2,370	
Slurry	—	
Oil/Gas Gathering	3,447	
	11,239	2,000
GRAND TOTAL		13,239

gas pipelines, 1168 miles of carbon dioxide pipelines, 4819 miles of crude oil pipelines, 5500 miles of refined products pipelines, and 8293 miles of coal slurry pipelines.

Biggest stimulant for the pipeline construction business has been the prebuilding of various sections of the Alaskan Highway Gas Pipeline Project in lower Alberta and British Columbia and in the Pacific Northwest states. Canada's National Energy Board decision to permit short-term exports (3.75 trillion cu ft by 1987) was instrumental in getting the prebuild work underway. Construction is now underway on the western leg of the pipeline system, with 341 miles of 30 and 24-in. pipeline being installed by Northwest Pipeline Corp. and 160.5 miles of 42-in. in loops on its 36-in. system by Pacific Gas Transmission Corp. The latter job got underway in mid-December 1980. Although gas was to begin flowing by late 1980, it now appears that first gas deliveries won't be made until some time in 1981.

Work on the eastern leg in the U.S. — the Northern Border Pipeline's 823-mile, 42-in. line from Monchy, Sask., on the U.S.-Canadian border to Ventura, Iowa — won't begin until spring. No contract awards will be announced until mid-January, at the earliest. The Canadian section of the eastern leg, some 395 miles of 42-in., will get underway in late spring or early summer. The one-year delay in construction on all of the eastern leg was caused by a State of North Dakota challenge to the pipeline routing.

The pipeline construction outlook in the United States for 1981—miles expected to be completed during the year—is 4124 miles of gas transmission pipelines, 578 miles of carbon dioxide (CO_2) pipelines, 720 miles of crude oil pipelines, 2370 miles of refined products pipelines, and 2477 miles of oil and gas gathering lines. A total of just over 2000 miles of pipelines of all types, including gathering lines, is forecast for Canada in 1981.

Gas Pipelines

As mentioned previously, work on prebuild sections of the Alaskan Highway Gas Pipeline Project is underway, with actual construction in progress on the western legs. There will remain, however, another 480 miles of loops on Pacific Gas Transmission's 36-in. mainline, with some of it to be 42-in. and most of it to be 36-in. to provide a second 36-in. line to the Oregon-California border. Another 290 miles of 36-in. is eventually to be installed by Pacific Gas & Electric as its part of the western leg.

Just for insurance, the Rocky Mountain Gas Pipeline proposed by Pacific Gas Transmission—695 miles of 20, 30, and 36-in. from Green River, Wyo., to near Needles, Calif. —would deliver gas from the rapidly developing Overthrust Basin area of southwest Wyoming, northwest Colorado, and northeast Utah.

Moving gas from the same general region eastward to western, midwestern, and eastern markets is the proposal of the Trailblazer Pipeline System, a $500-million project to take gas from the Rock Springs area. Mountain Fuel Supply Co. would build and operate 88 miles of 30-in., in western Wyoming; Colorado Interstate would build and operate a 264-mile, 36-in. section from western Wyoming to near Cheyenne, and Trailblazer Pipeline would be built by an affiliate company of Natural Gas Pipeline Co. of American (Peoples Gas of Chicago) and Columbia Gulf Transmission Co. NGPL would operate the 445-mile, 36-in. segment.

United Gas Pipeline Co. has two projects on the board—the 635-mile, 30-in. line from the Panhandle of Texas across Oklahoma and southwest Arkansas to West Monroe, La., a $386-million project—plus a 115-mile, 30-in. line from Ft. Bend County, Tex. to San Jacinto County, Tex., to provide additional transportation capacity from south Texas to the Houston area.

Northern Natural Gas plans include a 160-mile, 12-in. or larger gas line in southwest Texas to cost $35 million.

Florida Gas Transmission Co. will be building some 309 miles of 30-in. loops on its gas system if final FERC approval is received early in 1981. An administrative law judge has ruled that FGT can abandon its original 890-mile, 24-in. gas system (for conversion to products pipeline service) once the new loops are built and are operable.

Ozark Gas Pipeline expects a decision in early 1981 on its plan to build 445 miles of 4 to 20-in. gas pipelines in Oklahoma and Arkansas to provide a new outlet for Anadarko Basin gas.

Transcontinental Gas Pipeline Corp. and Algonquin Gas Transmission Corp. see light at the end of the tunnel in their plans to build a 350-mile gas pipeline from near Calais, Maine, to Burnville, R.I., to bolster gas supplies in the Northeastern U.S. Gas would come from the Trans-Quebec & Maritimes Pipelines, Ltd. projects; TQ&M plans to bring western Canadian gas to the Maritime Provinces and would export 250 million cu ft per day to U.S. markets.

Two other Northeastern U.S. gas pipeline projects remain on the books in various states of activity — the New England States Pipeline (350 miles of 30-in.) and the Tenneco Atlantic Pipeline, a 450-mile, 26-in. proposal between St. Johns, N.B., and Nassau, N.Y.

Offshore gas pipeline projects abound. Columbia Gulf Transmission and Natural Gas Pipeline Co. of America plan 127.7 miles of 10, 12, and 20-in. in the Eugene Island and West Cameron areas offshore Louisiana; Corpus Christi Oil and Gas plans a 250-mile, 24-in. line offshore Texas; Florida Gas Transmission and Tennessee Gas Pipeline plan 40 miles of 22-in. offshore Texas; High Island Offshore System plans 66 miles of 36-in.; Seagull Pipeline Co. plans 275 miles of 24-in. offshore Texas; Southern Natural Gas has projects totaling over 300 miles offshore Louisiana; Tennessee Gas Pipeline and Texas Eastern plan 174 miles of 16 thru 36-in. line offshore and onshore Texas and Louisiana; and Transcontinental Gas Pipeline Corp. has over 125 miles of various size offshore pipelines planned.

Two other projects of note include Western LNG Terminal's 286 miles of 42 and 48-in. from Point Conception to the Los Angeles area (whose construction depends on the final outcome of the LNG importation scheme to bring Indonesian gas to the U.S. West Coast), and Great Lakes Gas Transmission's continuing plan to build 365 miles of 30-in. to deliver gas from the Great Plains Coal Gasification Plant site in North Dakota to Thief River Falls, Minn. The coal gasification plant is currently stalled in the courts.

Carbon Dioxide Pipelines

Three CO_2 pipeline projects are underway in the U.S. — 30 miles of 10-in. between LaPorte and Texas City, Tex., for Air Products & Chemicals; 106 miles of 6-in. from Orla, Tex., to Fort Stockton, Tex., for Conoco, Inc.; and 42 miles of 8-in. in Mississippi for Pennzoil Production Co. The latter two reportedly are to transport CO_2 for use in enhanced recovery projects.

Atlantic Richfield is moving ahead with its 400-mile, 20-in. line from near Walsenburg, Colo. to Seminole, Tex., and Shell Oil Co. is proceeding with development of a carbon dioxide field and 500-mile, 20-in. pipeline to transport the gas from near Cortez, Colo., to the Wasson Field in West Texas. Mobil Oil Co. reportedly will join Shell in the Cortez Pipeline Co. project. The entire project is expected to be in operation by 1983. Shell is also planning a 90-mile, 20-in. CO_2 pipeline in Mississippi to supply an enhanced recovery project.

Crude Oil Pipelines

Northern Tier Pipeline Co., which has acquired nearly all of the major permits and approvals for its 1557-mile, 40 and 42-in. oil pipeline, hopes to resolve the controversy revolving around its terminal near Port Angeles and being perpetuated by obstructionists offering no alternatives.

Obstructionists posing as environmentalists also effec-

tively deferred the Northern Pipeline Co. of Delaware project—a 480-mile, 24-in. line to transport crude oil from Wood River, Ill. to St. Paul, Minn. That $130-million proposal by Koch Industries has now passed into oblivion. In its place came the Wood River Pipeline project—446 miles of 20 and 24-in. at a cost of $120 million. Final delivery route for the oil is longer and will cost more as delivered, but it did bypass the never-ending struggle. Project involves a new line from Wood River to Bethany, Mo., by Koch, a 193-mile, 24-in. loop by Williams Pipeline from Bethany to Mason City, Iowa, and final delivery through an existing 130-mile, 18-in. line from Mason City to the Minneapolis-St. Paul area.

Only other major crude oil pipeline undertakings announced as of 1981's beginning include 115 miles of 10-in. from Medford, Okla., to Conway, Kans., by Western Crude Oil, and Pacific Coast Pipeline's plans to pick up on the now defunct California-to-Texas Pactex project abandoned by Sohio.

Products Pipelines

Mapco, Inc. plans to continue its 1197-mile Rocky Mountain LPG system by extending it from Seminole, Tex. to the Houston/Mt. Belvieu area with 630 miles of 14 and 16-in.

Koch Hydrocarbons plans a 580-mile system from Medford, Okla., to the Houston area, which will require 380 miles of 8 and 10-in. connecting to an existing 200-mile line acquired by Koch.

Still lurking in the wings is the 890-mile, 24-in. conversion project of Transgulf Pipeline, an affiliate of Florida Gas Transmission Co. An FERC administrative law judge has approved sale of the existing 24-in. gas line from near Baton Rouge to Ft. Lauderdale, Fla., once FGT builds the necessary 309 miles of 30-in. loops on its gas system. The FERC judge said that, although the move would do harm to barges and ship traffic now transporting petroleum products to Florida, it would be beneficial to consumers.

Slurry Pipelines

There are now nine projects involving 8293 miles of slurry pipeline—all proposed for the movement of coal from mine to electric generating plants. Most likely project to come into existence is the Energy Transportation Systems, Inc. line, which is inching closer and closer to a construction beginning.

A new regime in Washington is expected to press harder for the right of *eminent domain* for slurry pipelines, and the firms involve remain confident they will eventually be given permission to build and operate their pipelines. **P&GJ**

Planned And Proposed Pipeline Projects

U.S.—Natural Gas Pipelines

COMPANY	MILES	SIZES (IN.)	FROM	TO	COST ($MILLIONS)	STATUS	CONTRACTOR OR ENGINEERING CO.
Alabama-Tennessee Natural Gas Co.	17.7	8	Lamar County, Miss.	Forrest County, Miss.	1.8	Planned	
Ammonia Enterprises Pipe Line Inc.	52	10	offshore-onshore La.			Planned	
Baltimore Gas & Electric Co.	40	3/8-20	Central Maryland		3.3	Underway	Company crews
Bear Creek Storage Co.	25.5	6-18	Bienville Parish, La.		60.7	Underway	Hallico and Trend Construction Co.
Brooklyn Union Gas Co.	23.4	2-24	Brooklyn, Queens, Staten Island, N.Y.		13.6	Planned	Company Crews
Cities Service Gas	76	4-12	Wyoming		5.8	Underway	Sterling Construction Co.
Citizens Gas & Coke Utility	79	1 1/4-16	Marion County, Ind.		3.7	Planned	Company crews
Colorado Interstate Gas Co.	225	2-10	Tex., Okla., Kans., Wyo., Colo., Utah		16.6	Underway	Sterling Construction Co., Holloman Construction
Columbia Gas Transmission Co.	23	12, 16	Flat Top, WV	Forest Hill, WV		Underway	Pace Pipe
	72	16, 20	Varney, WV	Ona, WV		Underway	Carl E. Smith
	26	8	Clay, Owsley, Lee, Estill counties, Ky.			Planned	
	347	2-26	Ohio, NY, Pa., Md., WV, Va., Ky.			Planned	Company crews
	56	10, 12	Chautauqua County, NY; Washington County, Ohio		10.6	Underway	L.A. Pipeline Co.
	38.7	6-10	Erie and Crawford counties, Pa.		6.3	Underway	Utility Constructors
Columbia Gulf Transmission Co.	12.9	10-16	Ship Shoal, offshore La.		9.5	Planned	
	21	6-10	Offshore La.		9	Planned	
	11	6	Eugene Island block 314C			Planned	
	4.9	12, 16	Offshore La.		9.9	Planned	
Columbia Gulf Transmission Co. and Natural Gas Pipeline Co. of America	127.7	10, 12, 20	Eugene Island & W. Cameron areas, offshore La.			Planned	
Commonwealth Gas Co.	13	2, 6	Central Mass.		0.6	Planned	
Consolidated Gas Supply Corp.	7.5	20	High Island offshore area, Tex.		8.1	Planned	
	19	24	Ritchie County, Va.	Doddridge County, Va.		Underway	Carl E. Smith
	9	8	Buck Run, Wetzel, Tyler counties, Va.			Underway	
	63	30	Canten, Ohio	Ohio River		Planned	
Consumers Power Co.	22	4, 6	Lower Michigan		3	Planned	
Corpus Christi Oil & Gas	250	24	Offshore Texas			Planned	
El Paso Natural Gas Co.	463	30-36	Port O'Connor, Tex.	Ft. Stockton, Tex.		Planned	
	30	4, 10, 16, 20	San Juan Co., N.M.			Planned	
	119.8	6 5/8, 20, 24	Eddy County, N.M.			Planned	
Florida Gas Transmission Co.	33.3	4, 8, 10	Offshore Texas		9.5	Planned	
	92.8	22, 26	Offshore Texas	Louisiana	34.6	Planned	
	375.8	4 1/2, 20, 26, 30	Zachary, La.	Ft. Lauderdale, Fla. (loops)		Planned	
	41.3	2, 24	Offshore Tex.	Refugio County, Tex.		Planned	
	309	30	loops on existing system			Planned	
Florida Gas Transmission Co. and Tennessee Gas Pipeline Co.	40	22	Offshore Tex.	Jefferson County, Tex.		Planned	
Great Lakes Gas Transmission Co.	30.1	36	Kittson, Clearwater, Beltrami counties, Minn.		18.7	Planned	
	125	36	Minn., Wisc., Mich.			Planned	
	365	20	Mercer Co., N.D.	Thief River Falls, Minn. (SNG)		Planned	
Gulf Energy & Development Co.	50	10-14	South Texas			Planned	
Gulf States Utilities Co.	110	1/2-8	East Baton Rouge Parish, La.		1.5	Planned	
High Island Offshore System	66	36	Offshore Texas		101	Planned	
Houston Pipe Line Co.	10	4, 12	Harris County, Tex.		12	Planned	
	20	20	Kiebert, Nueces counties, Tex.		10	Planned	
	5	24	Harris County, Tex.		3	Planned	
	92	20	Corpus Christi			Underway	H.K. McDermott Inc.
Kansas-Nebraska Natural Gas Co.	22.3	16	Lexington, Neb.	Riverdale, Neb.	2.5	Planned	
	18.1	16	Cairo, Neb.	Grand Island, Neb.	2.1	Planned	
	190	4, 6	Colo., Mont., Wyo.		8	Planned	
Lear Petroleum	85	20	Caddo, Grady, Washita counties, Okla.			Underway	Cap-Con
Louisiana Intrastate Gas Corp.	45	24	Irene, La.	Placquemine, La.	22	Underway	Ashley Enterprises
Matador Pipelines Corp.	60	16	Billings, Golden Valley, McKenzie counties, N.D.			Underway	Santa Fe Pipeline Construction Co.

COMPANY	MILES	SIZES (IN.)	FROM	TO	COST ($MILLIONS)	STATUS	CONTRACTOR OR ENGINEERING CO.
Michigan-Wisconsin Pipe Line Co.	63.2	12, 24, 30	Offshore La.	Onshore La.	73.9	Planned	
	3.5	10	Offshore Texas		4.9	Planned	
	49	12, 20	Tex., Okla., Kans.		16.8	Planned	
	81.4	36, 42	La., Ind., Ky., Miss.		62.2	Planned	
	12.1	42	Ind., Mich.		15.9	Planned	
	66	36	Offshore Tex.		101	Planned	
	15.3	30	Lowrey, La.			Planned	
Montana Fuel Supply Co.	35	10	Converse County, Wyo.	Douglas, Wyo.		Planned	
Mountain Fuel Supply Co.	4	20	Sweetwater County, Utah		1.2	Planned	
	392	2-10	Utah, Wyoming		6	Underway	Company crews
National Fuel Gas Supply Corp. & Natural Gas Storage Corp.	22	4-12, 16-36	Ellisburg, Pa.			Planned	
Natural Gas Pipeline Co. of America	8.4	6	Galveston	Offshore Tex.		Underway	Ingram Marine Construction
	26.9	16	High Island offshore Tex.			Underway	Brown & Root
	2.4	16	South Pass offshore Tex.			Underway	
	3.5	12	West Delta offshore La.			Underway	
	5	10	West Cameron offshore La.			Underway	
	2.7	8	West Cameron offshore Tex.			Underway	
	14.2	8	High Island offshore Tex.			Planned	
	48	30	Beckham County, Okla.	Hutchinson County, Tex.	18.9	Underway	H.B. Zachry Co.
	222	4, 10	Colo., Neb.		36	Planned	
	16	6, 12	Offshore Tex.		13.5	Proposed	
New England States Pipe Line	350	30	Northeast U.S.		420	Planned	
Northern Border Pipeline Co.	823	42	Montana	Illinois	1500	Underway	William Bros. Engineering
Northern Natural Gas Co.	50	12	Eddy Co., N.M.	Hobbs, N.M.		Planned	
	160.6	12, 16	Batesville, Tex.	El Dorado, Tex.	59.3	Planned	
	40	4-12	Batesville, Tex.	LaPryor, Tex.		Planned	
	13	6, 10	Offshore Tex.			Planned	
	4	6	Offshore La.			Underway	
	42.5	24	Offshore Refugio County, Tex.			Planned	
	15.2	12, 16	Offshore La.		5.79	Underway	Brown & Root
	45	12, 24	Offshore Tex.			Underway	
Northwest Alaska Pipeline Corp.	739	48	Prudhoe Bay	Alaska-Yukon border	3900	Planned	
Northwest Pipeline Corp.	341	24, 30	Oregon, Idaho		144	Underway	Banister, Great Plains, MK-River, Hood, Mid-Mountain
	80	6-12	Lincoln, Unita, Sweetwater cos., Colo.			Planned	
	200	4-12	Moxa Arch area, Wyo.		20.3	Underway	
Nueces Co.	24	4, 12	Kit Carson County, Colo.		1.3	Planned	
Oasis Pipe Line Co.	20	10, 12	Loving County, Tex.		5	Planned	
Oklahoma Natural Gas Co.	98	to 30	Oklahoma			Planned	
	30	12	Beaver County, Okla.	Ellis County, Okla.	3.6	Underway	K-M Engineering
Ozark Gas Pipeline Corp.	445	4-10, 20	Pittsburg, Okla.	White County, Ark.	104	Planned	
Pacific Gas & Electric Co.	290	36	Malin, Ore.	Brentwood, Calif.	236	Planned	
	40	30	Searchlight, Nev.	Southeast Calif.		Planned	
	162	16-36	California		9.4	Planned	Company crews
	8	20, 26, 30	California		4.55	Underway	Company crews
	36	16-26	California		22.73	Underway	Company crews
	28	30	California		19	Planned	
	103	34	California		91	Planned	
Pacific Gas Transmission Co.	160.5	42	Idaho, Ore., Wash.		116	Underway	M-K River
	432	36	Idaho, Ore., Wash. (loops)		301	Planned	
(Rocky Mountain Pipeline)	695	20, 30, 36	Green River Basin, Wyo.	Needles, Calif.	341	Planned	
Panhandle Eastern Pipeline Co.	110	4-12	Wyoming		24	Planned	
	60	4-8	Greely, Hamilton, Kearney counties, Kans.			Planned	
	60	4, 8, 16	Weld and Boulder counties, Colo.		6.9	Underway	
	56.6	6, 16	Kans., Okla., Tex.		25.7	Planned	
Pioneer Natural Gas	30	2-8	Texas Panhandle		1.5	Planned	
Rocky Mountain Natural Gas Co.	41	8 5/8	DeBeque, Colo.	Piceance Creek, Colo.		Planned	
Seagull Pipeline Co. (Houston Oil & Mineral Co.)	275	24	Cameron County, Tex.	Bolivar Penninsula		Planned	
Southern California Gas Co.	12	36	Aliso Canyon	Los Angeles		Underway	Hood
Southern California LNG Terminal Co.	63	32	Ventura County, Calif.			Planned	
Southern Natural Gas	40	18	Offshore La.		9.6	Planned	
	31.2	20	Thomaston, Ga.	Griffing, Ga.		Planned	
	20.7	18	S. Atlanta, Ga.	Austell, Ga.		Planned	
	44.7	12 3/4	Dalton, Ga.	Rome, Ga.		Planned	
	7.8	8	Offshore La.		1.56	Planned	
	22.46	16	Offshore La.		23	Planned	
	96.6	12-20	Clayton, Gordon, Douglas counties, Ga.		30.2	Planned	
	231	16	Offshore La.		23.8	Planned	
Southwest Gas Corp.	76	12, 20	Northern Nevada		26.1	Underway	
Southwestern Gas Pipeline	27	12 3/4	Millsap, Tex.	Morgan Mill, Tex.		Underway	Conner Construction
Tenneco Atlantic Pipeline	450	26	St. Johns, N.B.	Nassau, N.Y.		Planned	
Tennessee Gas Pipeline Co.	26.3	16, 20	Offshore La.		28.4	Planned	
Tennessee Gas Pipeline Co. and Texas Eastern	174.3	16, 24, 30, 36	Offshore-onshore Tex. and La.		274.1	Planned	
Tennessee Gas Pipeline Co. and Columbia Gulf Transmission Co.	26	26, 36	South Pass area, offshore La.		46.8	Planned	
Texas Eastern Corp.	113.4	30	Gillis, La.	New Roads, La.	125.7	Planned	
	58.5	36	St. Francisville, La.	Kosciusko, Miss.		Planned	
Texas Gas Transmission Corp.	6.58	10	High Island, offshore Tex.		6.1	Underway	
	20.45	4-12	St. Mary, Lincoln, Bienville, Assumption parishes, La.		3.2	Underway	
	10	10	Lincoln Parish, La.		1.9	Planned	
	4	12	High Island, offshore Tex.		6.3	Planned	
	32	20	Cameron Parish, La.		14	Planned	
Texas Sea Rim Pipeline Inc.	14	14	Sabine Pass area, offshore Tex.			Planned	
Trailblazer Pipeline (Natural Gas Pipeline Co. of America, Colorado Interstate Gas Co., Columbia Gulf Transmission Co., Mountain Fuel Supply Co.)	797	30, 36	Rock Springs, Wyo.	Beatrice, Neb.	430	Planned	
Trans-Anadarko Pipeline System	635	30 or 36	Texas Panhandle	Northern Louisiana		Proposed	
Transcontinental Gas Pipe Line Corp.	61	24	Texas		37.8	Planned	
	20.3	36	Louisiana		24	Planned	
	7.5	12	Louisiana		1.9	Planned	
	19	4, 8, 12	Louisiana		5.7	Planned	
	4	10	Offshore La.		4.4	Planned	
	7.5	6, 8	Offshore La.		4.7	Planned	
	28.1	10, 24	Offshore Tex.		24	Planned	
	3	16	Offshore Tex.		2	Planned	
	8.5	20	Offshore Tex.		2	Planned	
	12.9	20	Offshore Tex.		7.8	Planned	
(ownership interest)	31.2	20	Offshore Tex.		9.7	Planned	
(ownership interest)	15.3	10, 12	Offshore La., Tex.		4.4	Planned	
(ownership interest)	18.3	2, 24	Louisiana		2.2	Planned	
	88.56	20, 24	Offshore, onshore Tex.		78.4	Planned	
Transcontinental Gas Pipeline Corp. and Algonquin Gas Transmission Corp.	350	N/A	Calais, Maine	Burrillville, R.I.	420	Planned	
Transok Pipe Line Co.	85	2-8	Oklahoma		3	Underway	K-M Engineering, Great Southern, G&J Construction
	18	10-20	Oklahoma		2	Underway	K-M Engineering, Great Southern, G&J Construction
Trunkline Gas	79	16, 20, 30	Terrebone Parish, La.		64	Planned	
United Gas Pipe Line Co.	22	30	Vermilion Parish, La.			Planned	
	5	4	Louisiana			Planned	
	5	6	High Island, offshore La.	Cameron Parish, La.		Planned	
United Gas Pipe Line Co.	9	8	Rusk County, Tex.			Planned	A&A
	115	30	Ft. Bend County, Tex.	San Jacinto, County, Tex.	81	Planned	

COMPANY	MILES	SIZES (IN.)	FROM	TO	COST ($MILLIONS)	STATUS	CONTRACTOR OR ENGINEERING CO.
Valero Transmission Co.	212	16, 20	South Texas		44.3	Planned	
	50	36	North Texas		25	Planned	
	25.3	20, 24	Southeast Texas		44.3	Planned	
	20	12	East Texas		5	Planned	
Western LNG Terminal	286	42, 48	Pt. Conception, Calif.	Los Angeles area		Planned	

U.S. — Crude Oil Pipelines

COMPANY	MILES	SIZES (IN.)	FROM	TO	COST ($MILLIONS)	STATUS	CONTRACTOR OR ENGINEERING CO.
ARCO Oil & Gas	26	16	Kuparuk Field, North Slope	Alyeska Pump Station No. 1		Underway	M-K River
Ashland Pipe Line Co.	53	various	La., Ill. (gathering lines)			Planned	
Bi^eart Pipeline Co.	60	2-6	Oklahoma		2.5	Planned	
DEc^PORT	31	36	Harbor Is. Bay, Tex.	Corpus Christi, Tex.	500	Planned	
Department of Energy	14	16	Eastern Ky. strategic storage			Proposed	
	13	20	Southern Ohio strategic storage			Proposed	
New England Energy Co.	35	24	Portland, Maine	Sanford, Maine		Planned	
Northern Tier Pipeline	1550	40, 42	Port Angeles, Wash.	Clearbrook, Minn.	1400	Planned	Butler (E); Williams Bros. (E)
Northville Industries	211	30, 36	Galveston-Freeport	Texas City-Nederland		Planned	Brown & Root (E)
Pacific Coast Pipeline	1107		California	Texas		Planned	
Shell Oil Co.	17.3	16	San Pedro, Calif.	Long Beach, Calif.		Underway	
Shell Pipe Line Co.	11	6	Louisiana			Planned	
Texaco-Cities Service Pipeline Corp.	36	24	Southeast La.		50	Planned	
United Gas Pipe Line Co.	21	16	Harrison and Panola counties, Tex.			Planned	
	43	30	Natchitoches, Winn, LaSalle parishes, La.		27.8	Planned	
	5.3	10	Offshore Tex.		3.73	Planned	
United States Navy	135	30	Naval Petroleum Reserves, Redland, Calif.			Planned	
Upland Resources Inc.	24	4, 8	Mineral County, Va.			Underway	Joyce Western
Wallace & Wallace Chemical & Oil Co.	214	22-30	Mobile, Ala.	Tuskogee, Ala.		Planned	Ford, Bacon & Davis
Western Crude Oil	115	10	Medford, Okla.	Conway, Kans.		Planned	
Wood River Pipeline Co.	446	20, 24	Minn., Iowa, Ill.		135	Underway	Great Plains Construction; Gregory & Cook; Wilbros Energy Services
Standard Oil Co. (Ohio)	312	10, 12	Salem, Ill.	Lima, Ohio	7	Underway	International Engineering

U.S. — Products Pipelines

COMPANY	MILES	SIZES (IN.)	FROM	TO	COST ($MILLIONS)	STATUS	CONTRACTOR OR ENGINEERING CO.
Ashland Pipeline Co.	74	8	East Sparta, Ohio	Heath, Ohio		Planned	
	5	6	Western Ky.			Planned	
Barbour Energy Co.	390	20	Brownsville, Tex.	Houston		Planned	
Big Three Industries	67	12	Victoria, Tex.	Bay City, Tex.		Planned	
Buckeye Pipe Line Co.	22	10	Lawrenceville, Ohio	Robinson, Ill.	3	Underway	
	14	12	Ohio			Planned	
Coastal States Crude Gathering Co.	12.8	6	East Whites Point, Tex.	Clarkwood, Tex. (LPG)		Planned	
Enterprise Products Co.	55	6	Jay, Fla.	Alabama-Miss. border		Planned	
Exxon Pipeline	18	8	Southern Louisiana			Planned	
	14.4	4	Baton Rouge area			Planned	
	10	8	Houston area			Planned	
Farmland Industries	70	12, 16	Louisiana			Planned	
Getty Pipeline	25	16	Delaware City, Dela.	Marcus Hook, Pa.	10	Planned	
Gulf Refining Co.	36	10, 14	West Texas			Planned	
Koch Hydrocarbons	380	8, 10	Medford, Okla.	Houston		Planned	
MAPCO Inc.	1197	4-12	Seminole, Tex.	Rock Springs, Wyo.	110	Underway	Majestic Wiley; Curran Houston; Santa Fe Southeast
Seminole Pipeline Co. (MAPCO)	630	14, 16	Seminole, Tex.	Brenham, Tex.	130	Underway	
Shell Pipe Line Corp.	21.4	24	Norco, La.	Garyville, La.		Planned	
	11	6	Sorrento, La.	Convent, La.		Planned	
Southern Pacific Pipeline Inc.	36	24	Norwalk, Calif.	Colton, Calif.		Planned	
Southern Union Refining Co.	63	6	Lovington, N.M.	Artesia, N.M.		Underway	Ferguson Construction
Southern Union Refining Co. and Navajo Refining Co.	78	8	Artesia, N.M.	Orla, Tex.		Underway	McVean & Barlow
Texas Eastern Products Pipeline	9.8	8	Mt. Belvieu, Tex.	Baytown, Tex.		Planned	
Transgulf Pipeline (Gas line conversion)	890	24	Baton Rouge, La.	Ft. Lauderdale, Fla.	140	Planned	

U.S. — Carbon Dioxide (CO^2) Pipelines

COMPANY	MILES	SIZES (IN.)	FROM	TO	COST ($MILLIONS)	STATUS	CONTRACTOR OR ENGINEERING CO.
Air Products & Chemicals	30	10	La Porte, Tex.	Texas City, Tex.		Underway	Gregory & Cook
Atlantic Richfield	400	20	Walsenburg, Colo.	Seminole, Tex.		Planned	
Cortez Pipeline Co. (Shell Pipeline Co.)	500	20	Cortez, Colo.	West Texas (Wasson Field)		Planned	
Conoco Inc.	106	6	Fort Stockton, Tex.	Orla, Tex.		Underway	McVean & Barlow
Pennzoil Production Co.	42	8	Rankin, Madison, Yazoo counties, Miss.			Underway	Cap-Con International Inc.
Shell Oil Co.	90	20	Mississippi			Planned	

U.S. — Slurry Pipelines

COMPANY	MILES	SIZES (IN.)	FROM	TO	COST ($MILLIONS)	STATUS	CONTRACTOR OR ENGINEERING CO.
Allen-Warner Valley Energy Systems (Nevada Power Co.)	183	20, 24	Alton, Utah	Las Vegas, Nev.		Planned	
Continental Resources Inc. (formerly Florida Gas Transmission)	1500	24-48	Kentucky	Florida	1000-1500	Planned	Fluor
Energy Transportation Systems Inc.	1400	38	Wyoming	Baton Rouge, La.		Planned	Bechtel (E)
Pacific Bulk Transportation Systems (Boeing Engineering & Construction Co.)	650		Emory, Carbon counties, Utah	Port Hueneme, Calif.		Planned	Boeing (E)
San Marco Pipeline Co. (Houston Natural Gas, Rio Grande Industries)	900	20, 24	S.E. Colorado	Texas Gulf Coast	800	Planned	
Snake River System (N.W. Energy, Gulf Interstate)	1100	20, 24	N.E. Wyoming	Idaho, Oregon		Planned	
Tesoro Petroleum Corp.	1000	30	Kentucky	Southeastern U.S.		Planned	
Virgina Electric Power Co.	300	1[illegible]36	Proud, W.V.	Portsmouth, Va.		Planned	
Wytex System (Texas Eastern, Brown & Root)	1260	36, 40	Powder River basin, Wyo.	Houston area		Planned	Brown & Root (E)

Construction Outlook

Interprovincial Pipe Line Ltd.'s 28-mile, 34-in. loop project southeast of Edmonton was plagued by bad weather and took almost three months to complete. In a drier moment, PeBen Pipelines (1979) Ltd. welders finish up a short section of pipe.

Gas Line Prebuilding Sparks Canadian Pipeline Construction

by L. O. Rowland, *Canadian Editor*

Canadian pipelining in the 1980's has taken off with a rush that promises to keep the big-inch contractors busy for several years.

Sparked by the start of prebuilding on the Alaska highway gas pipeline in southern Alberta and southeastern British Columbia in the fall of 1980, the 1981 outlook is for a big year that may come close to the volume experienced in the 1960's. It is mostly gas-related, but the sales contracts and export permits are firm enough to indicate there will be a sustained good level of construction until the Alaska gas line is completed in 1985.

First off for the winter season, early in January 1981, is the muskeg portion of the 100 miles of 42-in. looping by Nova, an Alberta Corporation, (formerly Alberta Gas Trunk Line), on its Edson main gas transmission line. The second and third loops, amounting to about 60 miles, are due to be completed before spring breakup.

Two other major Nova projects are also slated for winter construction. The big-inch job is the Elmworth main line to link the Deep Basin gas processing plants by an express route to Edson, the northern end of the Edson main line, where the gas will be delivered into the new 42-in. loop. The Elmworth line consists of 166 miles of 24, 30, and (mostly) 36-in. pipe and includes a 42-in. crossing of the Wapiti River near the start, making provision for future looping without a second crossing. Completion is scheduled for early spring.

Nova is also scheduling the Kirby lateral in northeastern Alberta, 120.5 miles of mostly 16-in. pipe, to provide an outlet for significant volumes of gas covered by sales contracts from Pan-Alberta Gas Ltd. (a Nova subsidiary) to the American Midwest and Rocky Mountain markets. Situated in very fluid muskeg terrain, this prime winter job is also scheduled for spring completion.

Another major small-inch project under way for winter construction is the Peace Pipe Line Ltd. crude oil and gas liquids pipeline, which will carry ethane, propane, butanes and condensate as well as light crude oil, out of the Deep Basin region near Grande Prairie to join its existing system at Simonette. This job, consisting of 113 miles of 12-in., is due for completion in mid March. Henuset Rentals Ltd. is the contractor.

The 1981 summer program will be dominated by the eastern prebuild of the Foothills system. Plans are to call tenders in the spring for kickoff as soon as the frost is out of the ground. Foothills intends to have four spreads at work for most of the summer. Foothills Pipe Lines (Alta.) Ltd. will lay 235 miles of 42-in. main line across Alberta from Caroline to Empress on the Saskatchewan border, using three spreads. Foothills Pipe Lines (Sask.) Ltd. will put down 160 miles of 42-in. from Empress to Monchy on the Montana border, which will be the takeoff point for the Northern Border pipeline, for which tenders were called in November.

TransCanada Looping

Still in doubt for 1981 is the looping of the TransCanada PipeLines Ltd. main line, which will be required eventually if American approval of two export projects is granted and if the extension of the system to eastern Quebec and the maritime provinces occurs. The latter is supposed to be a priority project, but Canada federal policy is obscure and there is no indication of a start in 1981.

There is an outside possibility that, if FERC approvals come soon enough, TCPL may be in a position to lay at least part of its 295 miles of 42 and 48-in. looping that has already been approved by the National Energy Board. This work would be spread all across the western division in Saskatchewan and Manitoba, and in the northern Ontario segment of the system.

There is, also, more than an even chance that the first

CANADA — Natural Gas Pipelines

COMPANY	MILES	SIZES (IN.)	FROM	TO	COST ($MILLIONS)	STATUS	CONTRACTOR OR ENGINEERING CO.
Alberta Energy Co. Ltd.	290	2, 10	Southeastern Alberta			Planned	L&M, South Eastern Pipeline Construction, Spade Construction
Dome Petroleum	67	3, 10	Primrose-Kirby area			Planned	
Foothills Pipe Lines (Alberta) Ltd.	395	56	British Columbia	Caroline, Alta.		Planned	
	235	42	Caroline, Alta.	Empress, Alta.		Planned	
	99	36	Caroline, Alta.	Crowsnest, Alta.		Planned	
Foothills Pipe Lines Ltd. (Dempster Highway Lateral)	740	34	Whitehorse	Mackenzie Delta area		Planned	
Foothills Pipe Lines (North B.C.) Ltd.	444	56	Northern British Columbia			Planned	
Foothills Pipe Lines (Saskatchewan) Ltd.	160	42	Empress, Sask.	Monchy, Sask.		Planned	
Foothills Pipe Lines (South Yukon) Ltd.	232	48	Southern Yukon			Planned	
	276	56	Southern Yukon			Planned	
Foothills Pipe Lines (South B.C.) Ltd.	50	36	Southeastern British Columbia			Planned	
Gaz Metropolitan Inc.	24	2, 8	Montreal area		5	Planned	
Greater Winnipeg Gas Co.	39	2, 8	Winnipeg area		2.1	Planned	
	62.3	5.8-4	Winnipeg area		1.9	Planned	
Gulf Canada Resources Ltd.	113	2-16	Hamlan, Alta.			Planned	
	42.5	3-6	Alberta		8	Planned	
Hudson's Bay Oil & Gas Co.	35	4, 6	Alberta			Planned	
Nova (formerly Alberta Gas Trunk Line)	166	24-42	Elmworth gas field	Edson		Planned	
	120.5	4, 16	Kirby field	Nova main line		Planned	
	100	42	Edson main line loops			Planned	
	42	10	Irish field, Alta.			Underway	
	40	42	Alberta			Underway	
Polar Gas Project	2338	36, 42	Melville Island	Longlac, Ont.	7100	Planned	
Shell Canada Resources Ltd.	20	3, 6	Northwest Alta.			Planned	
TransCanada Pipelines Ltd.	295	42, 48	Sask., Ont., Manitoba loops			Planned	
	100	30	Montreal	Quebec City		Planned	
Union Gas, Ltd.	47	12-42	Southwest Ontario			Planned	
	36	16, 36	Southwest Ontario			Planned	
	11.2	42	Southwest Ontario			Planned	
	10.9	42	Southwest Ontario			Planned	
	10	8, 42	Southwest Ontario			Planned	
Westcoast Transmission	470	2-16	Williams Lake	Vancouver Island	260	Planned	
	83	12-24	British Columbia			Planned	
	41	36	British Columbia			Planned	
	30	6, 8, 26	British Columbia			Planned	

CANADA — Crude Oil Pipelines

COMPANY	MILES	SIZES (IN.)	FROM	TO	COST ($MILLIONS)	STATUS	CONTRACTOR OR ENGINEERING CO.
Esso Resources Canada Ltd. (Interprovincial Pipe Line Ltd.)	560	12	Norman Wells, NWT	Zama Lake, Alta.	360	Planned	
Husky Oil Operations Ltd.	89	6, 12	Cold Lake field	Lloydminster		Planned	
Murphy Oil	38	3.1.2, 8.5.8	Unity, Sask.	Bodo, Alta.		Planned	
	20	4, 10	Blackfoot, Alta.	Hazeldine, Alta.		Planned	
Trans-Mountain Oil Pipelines, Ltd.	571	30, 36	Edmonton	U.S. border		Proposed	

CANADA — Products Pipelines

COMPANY	MILES	SIZES (IN.)	FROM	TO	COST ($MILLIONS)	STATUS	CONTRACTOR OR ENGINEERING CO.
Alberta Energy Co. Ltd.	145	6	Edmonton	Cold Lake field	68	Planned	
	145	12	Cold Lake Field	Edmonton		Planned	
Alberta Products Pipe Line Ltd.	200	10	Edmonton	Calgary		Planned	Associated-Pullman Kellogg Ltd. (E)
Peace Pipe Line Ltd.	113	12	Grande Prarie	Simonette terminal	32	Underway	Henuset Rentals Ltd.
Trans-Northern Pipe Line Co.	4.5	13	Ottawa		1.4	Planned	

stage of extension of the TCPL main line in Quebec, from Montreal to Quebec City, will be built in 1981. This would take about 100 miles of 30-in.

Gas Lines

Another small-inch main line project practically assured for 1981 is the looping of the Alberta Products Pipe Lines Ltd.'s products line between Edmonton and Calgary. Tenders were called in November for the 193 miles of 10-in., which is required to supplement the overtaxed original products line installed 10 years ago. This will be a normal summer construction job, with completion scheduled for late summer with one spread.

A few small-inch gas transmission laterals are sure to be built in 1981, but the number and timing depends on the speed with which gas deliveries through the prebuild sections of the Alaska pipeline build up. Nova has a continuous program, but it is subject to continuous change with conditions. Few producers want to build their own laterals, and the current and prospective slump in the American market, with volume through the prebuild likely to be about half the long term contracted flow, suggests a good deal of lateral construction will be deferred to 1982, when the market position should be clarified.

In any case, much of the delivery facilities are already in place to handle the initial volume through the prebuild. A rough estimate indicates that Nova may build upwards of 300 miles of laterals in addition to its big Kirby project.

LPG Lines

Gas producers have several plans for LPG laterals and some of these will probably materialize in 1981. Amoco, Dome and PanCanadian are among the larger operators whose plans may develop to the construction phase. This is a complex business, as LPG extraction generally has to wait on the gas market, so companies with LPG projects which do not have firm gas markets will not be in a position to go ahead with pipelines. Weighing the prospects, about 200 miles of LPG laterals might be expected.

One promising project that was once intended for a 1981 start is very unlikely. Interprovincial Pipe Line Ltd.'s proposed line from Norman Wells, Northwest Territories to Zama, Alberta, is stalled by interventions of public interest groups at the National Energy Board hearings, and is virtually out of the running for approval in time to do anything before 1982. **P&GJ**

Construction Report

Australia To Experience Pipeline Construction Boom

by **William A. Scholes,** *Australian Correspondent*

Australia's pipeline industry will find itself facing an unprecedented construction boom in 1981. The big increase in demand for natural gas requires an increase in pipeline construction. At least 10 different pipeline jobs will be under construction in Victoria and New South Wales in 1981:

Victoria

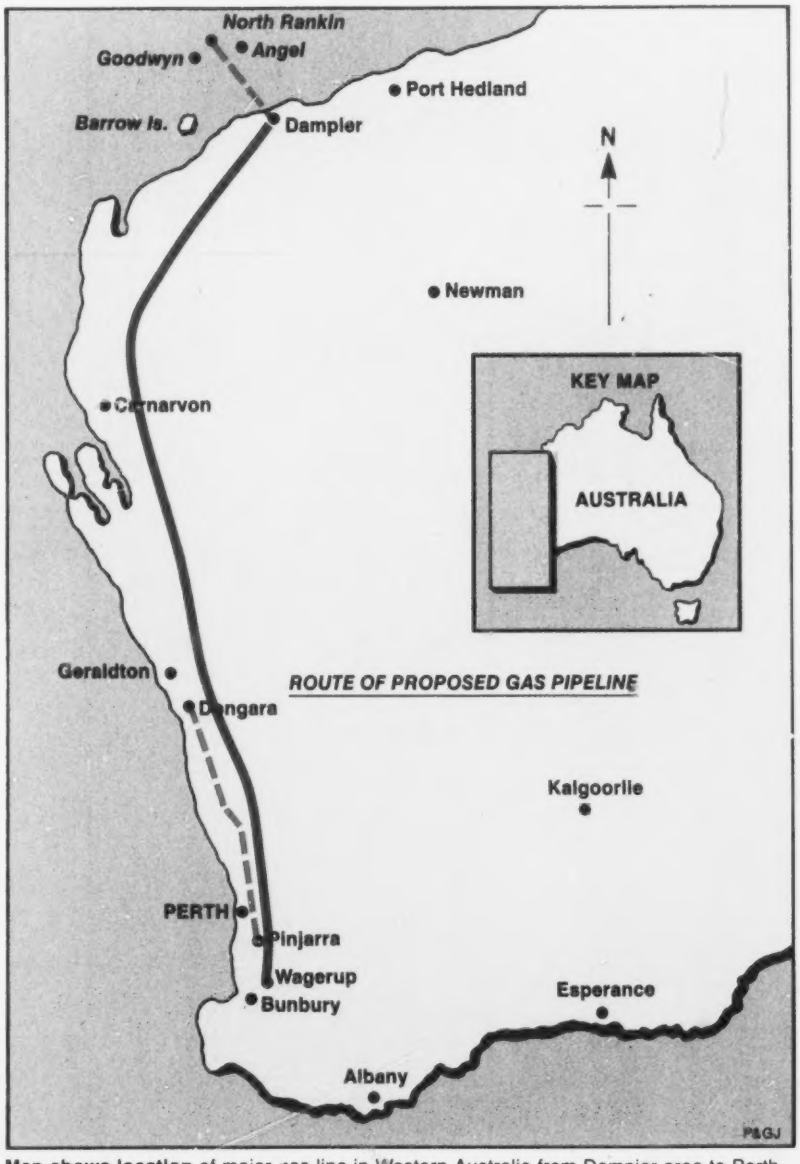
Company	Miles	Size (in.)	Type	Location
Esso Australia	55	28	Oil	Longford to Westbury.
Gas & Fuel Corp.	31.9	12	Gas	Mt. Franklin to Bendigo.
Gas & Fuel Corp.	15	12	Gas	Mt. Franklin to Kyneton.
Gas & Fuel Corp.	3.1	30	Gas	Dandenong.
Gas & Fuel Corp.	10	8	Gas	Shepparton to Tatura.

New South Wales

Company	Miles	Size (in.)	Type	Location
Aust. Gas Light Corp.	101.9	20	Gas	Plumpton to Hexham.
Newcastle Pipeline Co.	88.1	12	Products	Plumpton to Killingworth.
Hunter Pipeline Co.	15.6	14	Products	Silverwater to Plumpton.
Hunter Pipeline Co.	14.8	12	Products	Killingworth to Wickham.
Pipeline Authority	81.3	12	Gas	Young to Wagga.
Pipeline Authority	37.5	12	Gas	Dalton to Canberra.

Several projects are scheduled for construction later in 1981 and early 1982.

N.S.W. has pipeline projects under consideration and although the pipeline system to serve Orange, Bathurst, and Lithgow with natural gas has yet to be approved, it is only a matter of time.



Map shows location of major gas line in Western Australia from Dampier area to Perth area and location of North West Shelf production and pipelines.

Supply of natural gas to both Newcastle and Canberra is also going to generate a good deal of pipeline work in both these areas.

Work available in these two states will keep pipelines busy during the period leading up to the start of Western Australia's huge Dampier-to-Perth gas pipeline. Start of construction on that line should get underway late 1981 or early 1982, to make natural gas available in the last quarter of 1984.

Northern Territory

The Northern Territory Government has commissioned studies for piping Palm Valley gas to major mining areas in the Northern Territory and to Darwin. The only definite pipeline proposal out of Palm Valley, though, is for a gas pipeline to Alice Springs.

The Northern Territory Electricity Commission commissioned a study, carried out by Pipeline Technologists, that recommends a 150 km (93.75-mile) pipeline of 6 to 8-in. diameter.

Estimates of gas reserves in the Palm Valley gas field in the Northern Territory have been increased more than tenfold to between 1.4 and 4 billion m^3.

The Palm Valley gas field has been the centre of many pipeline proposals. In 1973, Bechtel Corp. prepared a report suggesting piping gas to the coast and liquefying the gas for export. The Palm Valley gas field has also been proposed as the central link in a transcontinental pipeline from the Northern Territory Shelf to the Eastern States.

Melbourne "Outer Ring" Pipeline

The Gas Fuel Corporation of Victory plans to build a pipeline to take natural gas from Pakenham to Wollert in Victoria. The pipeline plan is known as Melbourne's Outer Ring Main. It will be 91 km (56.9 miles) and 30-in. diameter. Estimated cost of the pipeline is $A42 million.

The corporation said that the pipeline is needed to handle the increased demand for natural gas, which is causing overloading of the corporation's present transmission pressure system.

Unless corrective measures are taken, a critical situation will be reached whereby demand cannot be met. This is likely to occur initially in that section of the pipeline that traverses Melbourne's northern and western suburbs, particularly in the section between the offtakes to the country areas at Keon Park and Brooklyn.

Several projects currently underway will have the short term effect of deferring this critical low pressure situation. These projects include:

- Duplication of a short section of a 30-in. pipeline between the Dandenong City Gate station and the metropolitan ring pipeline at Henty St., Dandenong.
- Installation of a liquefied natural gas peakshaving plant at Dandenong.

A proposal to install compressors on the metropolitan ring pipeline was rejected because the cost benefit ratio was unfavorable, benefits would be short term only, and noise control difficulties would be encountered.

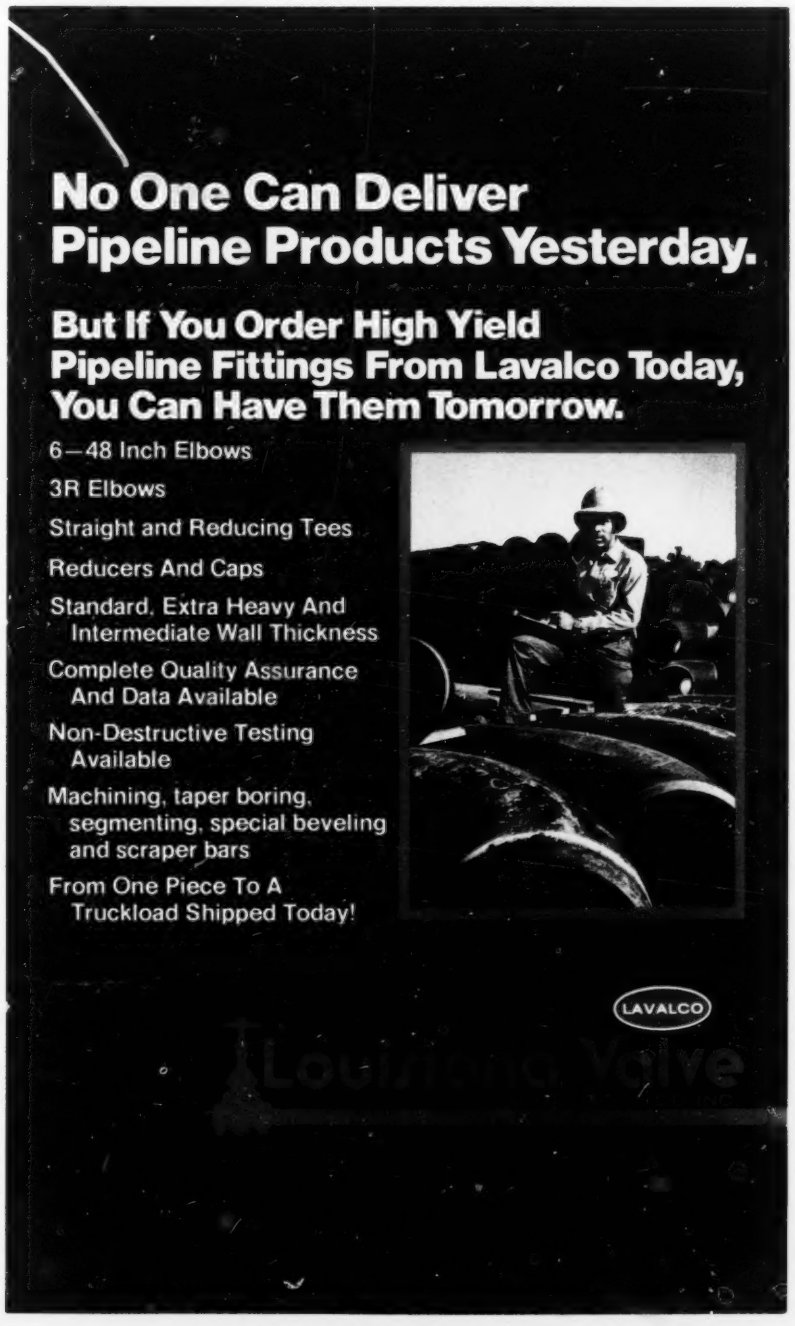
Upon completion of the two projects, the basic system will be operating at optimum capacity and cannot be upgraded in any significant way.

The corporation said the most efficient way to achieve their objective was to construct a pipeline from the Longford-Dandenong pipeline at Pakenham to the metropolitan ring pipeline in the vicinity of Keon Park.

Construction of the pipeline will be over three years commencing in 1983.

Western Australia

Now that the long-awaited official go-ahead has been given to the $A5000 million North West Shelf project, the Australian pipeline industry is on the verge of its busiest era.


No One Can Deliver
Pipeline Products Yesterday.
But If You Order High Yield
Pipeline Fittings From Lavalco Today,
You Can Have Them Tomorrow.
6—48 Inch Elbows
3R Elbows
Straight and Reducing Tees
Reducers And Caps
Standard, Extra Heavy And Intermediate Wall Thickness
Complete Quality Assurance And Data Available
Non-Destructive Testing Available
Machining, taper boring, segmenting, special beveling and scraper bars
From One Piece To A Truckload Shipped Today!
LAVALCO

Circle 136 on Reader Service Card

The latest technology will be required for the project's 134 km (84-mile) submarine pipeline from the North Rankin gas field and the WA State Energy Commission's 147 km (919 mile) onshore pipeline to the southwest.

Laying the submarine line in depths of up to 130 m in an area subject to cyclonic weather is expected to prove hazardous.

The onshore line, from the receival site at South Withnell Bay to the industrial centres of Perth, Kwinana and Wagerup will be the longest pipeline ever laid in the Southern Hemisphere.

The pipeline will require a work force of about 1650, in three separate units spread over the length of the route.

Woodside Petroleum Ltd., the company developing the North West gasfields, has timed the first phase of its project to begin pipeline sales to the southwest WA markets in 1984.

The liquefaction components of the project (liquefied natural gas and liquefied petroleum gas) are scheduled to begin in 1986.

The offshore pipeline system will run from the North Rankin A platform. Provision for inter-platform lines to North Rankin B and future platforms in other fields has also been made.

The trunkline from the platforms will be 40-in. diameter. The 1471 km onshore line will vary between 26 and 32-in.

A major aspect of the pipeline system design was the assessment of the feasibility of two-phase flow for the transportation of gas and condensate from North Rankin to shore.

The trunkline route was selected after hydrographic and soil surveys in 1978. The route generally follows a straight line from North Rankin A to the eastern side of the entrance to Mermaid Sound. Minor deviations to either side of the straight line route have been specified to minimize bottom roughness and to maximize the available sediment cover for burial of the pipe.

The pipeline passes through the eastern side of Mermaid Sound as far removed as practicable from the iron ore carrier anchorages, to a landfall south of Withnell Bay.

In addition to the hydrographic and soil studies, a 13-month oceanographic and meteorological data gathering program was conducted. Instrumentation was deployed at the platform areas, along with proposed pipeline route, and in Mermaid Sound, to provide continuous records of currents, waves, tides, water temperatures and salinity.

An extensive study was conducted to estimate extreme bottom currents caused by cyclones.

To meet the operational and constructional stresses in the pipeline, API 5LX 65 grade steel will be used, requiring wall thickness of 23.8 mm (0.937-in.).

In Mermaid Sound, where the pipeline runs close to the ore carriers holding area and where the relatively shallow areas may become a surf zone when a cyclone passes, pipe will be laid in a pre-dredged trench and back-filled with graded material after pipe lay is completed.

Further offshore trenching of the pipeline will be accomplished by conventional jet barge or the use of the newly-developed drenching plough.

In areas of outcropping rock where burial becomes impracticable, the pipeline will be stabilized by grout bags or rock armoring.

The Withnell Bay plant will produce four products, gas for WA (385 million cu ft per day), condensate (1.4 million tons per year), liquefied petroleum gas (640,000 tons a year) and liquefied natural gas (6 million tons a year).

P&GJ

SPECIALIST IN PRODUCTS FOR THE PIPELINE INDUSTRY...

Ladish, Limitorque, Tom Wheatley Co. and Ponca Fab products in stock and ready to ship!

Modern Supply is the authorized full-line stocking distributor of Ladish quality products. Specializing in Hi Yield with size ranges 6-36 inches, grades 42, 50, 60 and 65, wall thicknesses standard through .750 with taper bore capabilities.

In addition to the Tom Wheatley Co. fabricated check valve and Grove's fabricated C-3 check valve, we maintain an outstanding line of ball and gate valves with size ranges from 2-24 inches. We also have the capabilities of adding our Ponca Fab Division's extensions and Limitorque operators to meet customer specifications.

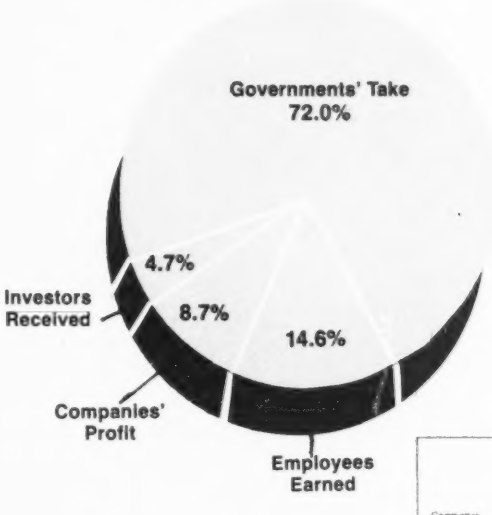
For catalog, write or call:

Modern Supply co.

P.O. Box 2069 / Ponca City, Oklahoma 74601
Phone: (405) 765-2524 / Tulsa: (918) 582-7381 / Houston: (713) 680-1003
TWX: 910-837-3710

Circle 138 on Reader Service Card

Beneficiaries of Integrated Oil Companies' Operations			
Employees' pay and benefits after taxes	$ 17.233 billion	EMPLOYEES EARNED	14.6%
Earnings of 44 companies after dividends	$ 10.359 billion	COMPANIES' PROFIT	8.7%
Dividends after taxes paid by stockholders	$ 5.593 billion	INVESTORS RECEIVED	4.7%
Taxes paid by companies/investors/employees and collected from consumers	$ 85.367 billion	GOVERNMENTS' TAKE	72.0%
BOTTOM LINE	$118.552 billion		100.0%



Governments Take 72%

by Ernestine Adams, *Editor, Energy Management Report*
and Julie Fonner, *Assistant Editor*

Governments are the winners, hands down, in oil company operations. In 1979, the 44 companies we surveyed for the fifth year, provided governments (local and national, U.S. and foreign) with a minimum 72% of their take from consumers.

This does not include government revenues from companies handling equipment, services and supplies and their stockholders and employees. They pay as much or more into government coffers as oil companies do.

Purchases of capital goods like refinery units and tanks, services like drilling and pipeline laying, supplies such as chemicals and pencils, make up a major part of an oil company's expense column.

The companies that provide those items are swamped by taxes which their customers have to cover.

"Windfall Profits" tax in the U.S. was not broken out because it did not operate for the full year. It is included in "Other Taxes." The sum of that column rose from $38.6 billion in 1978 to $55.7 billion in 1979.

Governments' take rose a couple of points. It was 70.2% in 1978. Other groups were down slightly percentage-wise, although actual figures were up over 1978.

WHO GOT WHAT FROM 44 OIL COMPANIES' OPERATIONS IN 1979

Company	COMPANY'S PROFIT: Net income* after dividends ($000)	INVESTORS RECEIVED: Dividends (common & preferred) ($000)	EMPLOYEES EARNED: Payrolls & Benefits ($000)	GOVERNMENTS' TAKE: Taxes on Dividends[1] ($000)	Taxes on employees' share[2] ($000)	Excise taxes on products[3] ($000)	Other taxes[4] ($000)	Total taxes ($000)
Amerada Hess	365,920	84,205	186,000[6]	16,841	62,000	98,000[6]	891,920	1,068,761
American Petrofina	32,759	25,214	81,525	5,043	27,175	46,741	74,277	153,236
Ashland Oil	387,315	69,469	524,862	13,894	174,954	266,496	333,227	788,571
Atlantic Richfield	508,761	337,492	1,122,400	67,498	374,133	442,718	1,429,506	2,313,855
Cities Service	159,100	94,200	481,000	18,840	160,333	144,800	382,900	706,873
Clark Oil & Refining	28,412	6,623	90,900	1,325	30,300	134,345	56,488	222,458
Coastal Corp.	77,983	11,249	163,000	2,250	54,333	48,200	82,600	187,383
Conoco Inc.	449,295	183,195	1,059,600	36,639	353,200	203,400	2,749,500	3,342,739
Crown Central Petr.	58,384	6,647	43,591	1,529	14,530	82,204	58,780	156,843
Crystal Oil	6,421	1,906	8,857	381	2,952	0	11,025	14,358
Diamond Shamrock	24,409	76,857	341,000	15,371	113,667	18,348	108,058	255,444
Dorchester Gas	25,105	47	10,946	10	3,649	646	32,747	37,052
Earth Resources	5,963	5,262	21,080	1,052	7,027	9,600	20,640	38,319
Exxon	857,063	1,719,090	4,182,000	343,818	1,394,000	4,448,582	16,906,707	23,093,107
Getty	373,331	116,087	353,765	23,217	117,922	154,787	1,109,787	1,405,713
Gulf Oil	518,000	402,000	1,481,000	80,400	493,667	1,983,000	2,404,000	4,961,067
Holly Corp.	7,023	0	9,402	0	3,134	6,000	5,125	14,259
Husky Oil Ltd.	70,104	11,498	95,400	2,300	31,800	68,600	65,126	167,826
Kerr-McGee Corp.	79,819	40,099	252,000	8,020	84,000	81,000	174,473	347,493
Louisiana Land & Expl.	64,210	52,417	62,819	10,483	20,940	0	164,853	196,276
Mapco Inc.	19,365	26,374	106,000	5,275	35,333	3,915	68,163	112,686
Marathon Oil	125,716	84,773	335,070	16,955	111,690	455,461	983,665	1,567,771
Marion Corp.	17,075	1,086	9,396	217	3,132	0	16,358	19,707
Mobil Corp.	925,556	540,801	3,603,000[6]	108,160	1,201,000	2,764,411	11,932,591	16,006,162
Murphy Oil	78,733	12,424	94,859	2,485	31,620	183,155	235,710	452,970
Occidental Petroleum	303,086	126,780	799,523	25,356	266,508	714	1,514,471	1,807,049
Pacific Resources	9,352	18,227	16,128	3,645	5,376	0	14,636	23,657
Pennzoil Co.	79,682	79,418	219,400	15,884	73,133	28,008	186,342	303,367
Phillips Petroleum	474,167	208,477	863,000	41,695	287,667	156,000	1,394,944	1,880,306
Quaker State	1,419	16,351	94,370	3,270	31,457	18,495	34,170	87,392
Shell Oil	481,159	322,201	1,173,000	64,440	391,000	790,822	1,090,056	2,336,318
Southern Union Co.	6,242	13,912	47,000	2,782	15,667	429	38,190	57,068
Standard California	794,770	494,962	1,120,000	98,992	373,333	990,863	2,347,023	3,810,211
Standard Indiana	621,358	442,630	1,287,854	88,526	429,285	1,267,400	2,016,970	3,802,181
Standard Ohio	892,180	146,968	541,071	29,394	180,357	305,726	1,009,729	1,525,206
Sun Co.	354,700	172,600	979,300	34,520	326,433	459,400	716,200	1,536,553
Tenneco	21,000	259,000	1,500,000[6]	51,800	500,000	260,000	325,000	1,136,800
Tesoro Petroleum	40,189	9,565	61,522	1,913	20,507	20,000	44,988	87,408
Texaco Inc.	608,153	575,458	1,701,800	115,092	567,267	3,116,214	3,770,800	7,569,373
Tipperary Corp.	2,321	0	3,934	0	1,311	0	1,573	2,884
Texas Eastern Corp.	37,336	80,362	120,015	16,072	40,005	0	270,156	326,233
Tosco Corp.	78,028	1,108	92,230	222	30,743	102,428	86,322	219,715
Union California	275,404	112,600	486,300	22,520	162,100	400,852	545,000	1,130,472
United Refining	12,953	2,111	22,906	422	7,635	67,953	17,731	93,741
TOTAL	10,359,321	6,991,745	25,848,825	1,398,348	8,616,275	19,629,713	55,722,527	85,366,863

[1]Taxes on dividends are 1/5; inflation increases tax without a rate increase. [2]Employees' taxes are estimated at 1/3, calculated by Taxpayers' Foundation as the average rate for employed persons. [3]U.S. federal excise tax is 4¢/gallon on gasoline in 1979; state taxes averaged about 8¢/gallon. Other products have lower excise tax. [4]Taxes levied directly on companies: Income taxes (before dividends), property taxes, severance taxes on oil/gas production, sales taxes on goods purchased, tariffs, and "Windfall Profits Taxes." *Excluding non-recurring items. [6]Estimate.

PROFESSIONAL OPPORTUNITIES

"If output is to grow, one of productivity's vital ingredients, the input of energy, must be available and usable," President John F. Bookout of Shell Oil told a faculty group last spring.

There is no statistical link between energy and productivity but you can see a logical tie. With no energy to run an economy, you have no modern economy.

It is obvious also that productivity of the American worker, and those of other nations, has declined since energy was controlled. In the 1947-1967 period an annual gain of 3.7% was recorded in the U.S. From 1967-1977 average increase came down to 1.8%.

Last year and most of this year the figures see-sawed downward, putting the U.S. in the minus column. Productivity dropped in second quarter of 1980 by an annual rate of 1.9% after a decline of 0.6% in first quarter. That was the sixth decrease in succession. Labor Dept. said U.S. business had a 2.6% rise in productivity for the third quarter.

An associate director of Commerce Dept.'s Bureau of Economic Analysis puts it succinctly: "Productivity has gone to pot since 1973."

The energy industry needs an influx of professionals--managers, geologists, engineers (all kinds)--and without them we can't get the economy off the ground. Energy operations always need special technology and today it needs it more than ever.

Consulting services here and in other industrialized nations are esstenial to devise plans for oil and gas operations in states where politicians run the energy business.

In earlier days coal ran the economy of industrial states. Now coal industry is limited by deterioration of infrastructure and environmental laws. Getting coal out of the ground and to market is work too hard for current laborers.

Coal is found in every continent, but the U.S. is estimated to have the largest reserves. It is being exported from U.S., however, because regulations have discouraged use. Transportation problems and lack of ports hold down production.

When chief executives of national oil firms from Organization of Petroleum Exporting Countries members met in Vienna, main topics included manpower evaluation and on-the-job training. U.S. problems are multiplied in other countries.

And the U.S. does have shortage problems of professionally trained and experienced people. Some executives wonder if the synfuels program, which will require squadrons of engineers and scientists, can operate with the present supply.

Says one man who should know, "The work load for engineers is going to double."

What this section will strive for is to help fill jobs that increase energy, which will, in turn, increase the hum of the economy.

Company	Professional* Employees 1979	1978	1977
Adams Res. & Energy	150	100	
Altex Oil	3	4	
Amarex Inc.	26	31	34
Amcole Energy	6	12	
Argonaut Energy	13	12	9
Argo Petroleum	22	25	25
Ashland Oil	6,535	7,107	7,296
Brock Exploration	20	20	12
C&K Petroleum	46	40	
Centura Energy	23	23	
Columbia Gas	1,022	1,022	1,022
Commonwealth N.R.	52	52	52
Commonwealth OR	459	416	438
Consolidated N.G.	1,675		
Consolidated O&G	16	9	7
Crystal Oil	229	198	142
Energy Reserves Gp.	220	200	170
Enserch Corp.	7,095	6,263	5,419
Felmont	35	39	37
Forest	250	250	
Galaxy Oil	13	10	12
Hadson Petroleum	24	19	
Helmerich & Payne	194	169	154
Howell Corp.	60	150	140
Inexco Oil	70	60	50
Juniper Petroleum	24	24	21
Louisiana L&E	301		
MGF Oil	80	60	
Mapco Inc.	500	390	350
Marion Corp.	42	36	34
May Petroleum	24	21	8
McMoRan Oil & Gas	105	63	38e
Mesa Petroleum	84	75	56
Mitchell Energy	633	575	525
Noble Affiliates	165	150	
Peninsula Resources	12	10	
Petro-Lewis	417	326	246
Phillips Petroleum	7,820	7,150	6,670
Pioneer Corp.	546	530	519
Quaker State	500	515	485
Sabine Corp.	70	60	40
Southland Royalty	199	258	224
Sundance Oil	16		
Supron Energy	56	51	45
Tesoro Petroleum	660	683	717
Texas American	21	18	16
Texas Eastern	650	634	568
Transco Companies	825	745	653
Tribune Oil	3	3	3
United Energy Res.	1,063	923	806
Universal Resources	45	44	35
Vanderbilt Energy	12	10	7
Woods Petroleum	62	67	57
Worldwide Energy	20	20	20
TOTAL	30,426	28,993	27,154

eEstimate. *Managers, lawyers, engineers, geologists, accountants, scientists, etc.

FEB., MAR. 1981 NOT FILMED